

Description of *Spelaeoecia saturno*, a new species from an anchialine cave in Cuba, (Crustacea: Ostracoda: Myodocopa: Halocyprididae)

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Abstract.—A new troglotic halocyprid species of Ostracoda, *Spelaeoecia saturno*, is described from Cueva El Saturno, Holguín Province, northeast coast of Cuba. Also, *Spelaeoecia cubensis* Kornicker & Yager, 1996, is reported from two additional caves in southern Matanzas Province: Cueva El Brinco and Cueva 1900.

Two troglotic species in the Halocyprida have been described previously from caves in Cuba: *Danielopolina orghidani* (Danielopol, 1972), from northern Matanzas Province, and *Spelaeoecia cubensis* Kornicker & Yager, 1996, from southern Matanzas Province. Also, *Thaumatocypris* sp. (= *Danielopolina* sp.) was reported from Santiago de Cuba Province by Orghidan et al. (1977:30) (see Kornicker & Yager 1996:15). *Spelaeoecia cubensis* is reported herein from two additional caves in southern Matanzas Province, and a new species of *Spelaeoecia* is described herein from Holguín Province (northeast coast). The distribution of anchialine halocyprids in Cuba is shown in Fig. 1 and Table 1.

Descriptions of caves.—Cueva El Saturno is an anchialine cave located on the northern coast of Holguín Province, Cuba, near the international airport for the seaside resort of Varadero Beach, east of Havana. Because of its locality near the resort, the cave is heavily used by tourists who snorkel and swim in the surface waters. Analysis of water chemistry indicates two density interfaces with an increase in salinity and a decrease in dissolved oxygen with increasing depth (Table 2).

Cueva El Brinco and Cueva 1900 are located on the southern coast of Matanzas

Province, Cuba, near the resort town of Playa Giron, and less than one kilometer from the Caribbean Sea. Cueva El Brinco is a narrow, deep crack or fault cave. It is oligotrophic, supporting little life. Both caves are in close proximity to Cueva de los Carboneros and Casimba Susana (also known as Cueva Susana) from which specimens of *Spelaeoecia cubensis* Kornicker & Yager, 1996, have been reported previously (Kornicker & Yager 1996:3).

Disposition of specimens.—All specimens have been deposited in the National Museum of Natural History, Smithsonian Institution, and have been assigned USNM catalog numbers.

Halocyprida Dana, 1853
Halocypridina Dana, 1853

Composition.—The suborder comprises the superfamilies Halocypridoidea Dana, 1853, and Thaumatocypridoidea Müller, 1906. Only the former superfamily is represented in the collections reported upon herein.

Halocypridoidea Dana, 1853

Composition.—The superfamily includes the single family Halocyprididae Dana, 1853.



Fig. 1. Map of Cuba showing approximate locations of anchialine species of Halocypridina.

Family Halocyprididae Dana, 1853

Composition.—The family comprises five subfamilies of which only the *Deevyinae* Kornicker & Iliffe, 1985, is represented in the present collections.

Subfamily *Deevyinae* Kornicker & Iliffe, 1985

Composition.—The subfamily comprises the genera *Deevya* Kornicker & Iliffe, 1985, and *Spelaeoecia* Angel & Iliffe, 1987, of which only the latter is represented in the present collections.

Spelaeoecia Angel & Iliffe, 1987

Composition and distribution.—The genus includes 10 species from anchialine caves in five areas.

Bahamas: *S. capax*, *S. sagax*, *S. styx* Kornicker, 1990 (in Kornicker et al. 1990), *S. barri* Kornicker & Barr, 1997, and *S. parkeri* Kornicker & Iliffe, 2002 (in Kornicker et al. 2002).

Bermuda: *S. bermudensis* Angel & Iliffe, 1987.

Cuba: *S. cubensis* Kornicker & Yager, 1996, and the new species described herein.

Jamaica: *S. jamaicensis* Kornicker & Iliffe, 1992.

Table 1.—Distribution of anchialine ostracodes in suborder Halocypridina (Halocyprididae, Thaumatoocyprididae) in caves of Cuba. (— = none present.)

Locality	Taxa	
	Halocyprididae <i>Spelaeoecia</i>	Thaumatoocyprididae <i>Danielopolina</i>
Holguín Province		
Cueva El Saturno	<i>S. saturno</i>	—
Matanzas Province		
Cueva El Brinco	<i>S. cubensis</i>	—
Cueva 1900	<i>S. cubensis</i>	—
Casimba Susana	<i>S. cubensis</i>	—
Cueva de los Carboneros	<i>S. cubensis</i>	—
Grieta Punta de Guana Matanzas	—	<i>D. orghidani</i>
Santiago de Cuba Province		
Cueva del Agua	—	<i>D. species</i>

Table 2.—Water chemistry at various depths for Cueva El Saturno.

Depth (m)	Salinity (ppt)	Dissolved oxygen (mg/L)	Temperature (°C)
3	3	5.5	25.1
6	3	5.6	25.0
9	3	5.7	24.8
12	5	5.4	24.8
15	26	1.7	24.8
19	32	0.6	24.9

Mexico: *S. mayan* Kornicker & Iliffe, 1998.

Spelaeoecia saturno, new species
Figs. 2–11

Etymology.—The species is named for the cave in which it was collected as a noun in apposition.

Holotype.—USNM 194617, dissected adult female on slide and in alcohol.

Type locality.—Cueva El Saturno, Holguín Province (northeast coast), Cuba.

Paratype.—Cueva El Saturno: USNM 194618, dissected A-1 male on slide and in alcohol.

Distribution.—Cueva El Saturno, Holguín Province, Cuba.

Description of female (Figs. 2–9).—Carapace uncalcified, flexible, elongate; dorsal margin straight, ventral margin broadly rounded; anterior incisur dorsal to mid-height (Fig. 2a). Anterior outer part of rostrum broadly overreaching edge of valve; rostrum of left valve short (Figs. 2f, g, 3b, c), whereas that of right valve elongate (Figs. 2e, 3b, d). Ridge present on right valve proximal to rostrum (Fig. 2a, e). Posterodorsal corner of each valve with obtuse angle (Fig. 2a, c, d); right valve with glandular opening indicated by minutely digitate edge and 1 or 2 minute bristles (Figs. 2c, 3e); left valve with minute glandular pore (Fig. 3e, f). Posterior (Fig. 3e, f) and anterior edges of valves with glandular pores.

Ornamentation: Ventral, anterior (Fig.

3c), and posterior margins (Figs. 2c, d, 3e, f) with widely separated single bristles.

Infold: Broad infold along anterior (Fig. 3c, d), ventral, and posterior margins (Fig. 3e, f); posterior list intersects valve edge dorsal to midheight (Fig. 3f).

Hingement: Indistinct linear ridge near posterodorsal corner of right valve and indistinct socket near posterodorsal corner of left valve (Fig. 3e).

Carapace size (length, height in mm): USNM 194617, 0.99, 0.68.

First antenna (Figs. 4a–c, 9c, e): 1st joint with minute distal spines (not shown). 2nd joint with minute distal medial spines; 3rd joint bare, fused to 4th joint (boundary indicated by ventral and dorsal indentations and discontinuities in sclerotization at ventral and dorsal margins). 4th joint shorter than 3rd, with dorsal bristle (although terminal ventral corners of both limbs of USNM 194617 are without a bristle, indistinct structures (not shown) at the distal ventral corner of the joint suggest that a bristle previously may have been present, and, therefore, it is tentatively interpreted here that the 4th joint usually bares a ventral bristle (the presence of a ventral bristle on the 4th joint of the 1st antenna of A-1 male, USNM 194618, is considered to support this interpretation (Fig. 10b, c)). 5th and 6th joints fused on lateral side; 5th joint with short dorsal spines and long ventral filament. 6th joint with short distal spines. 7th joint with ringed a-bristle (broken on both limbs of USNM 194617), and long ventral b- and c-bristles. 8th joint with d-, e-, f-, and g-bristles (e-bristle lateral and with widely separated short marginal spines at midlength).

Second antenna (Figs. 4d–h, 9c, e): Protopodite bare. Endopodite 3-jointed (Fig. 4e, h): 1st joint with slender spinous ringed a- and b-bristles; 2nd and 3rd joints fused; 2nd joint with small c-bristle and long stout f- and g-bristles; 3rd joint with long stout filamentous h-, i-, and j-bristles. Exopodite with 9 joints (Fig. 4f): 1st joint divided into long proximal and short distal parts, and

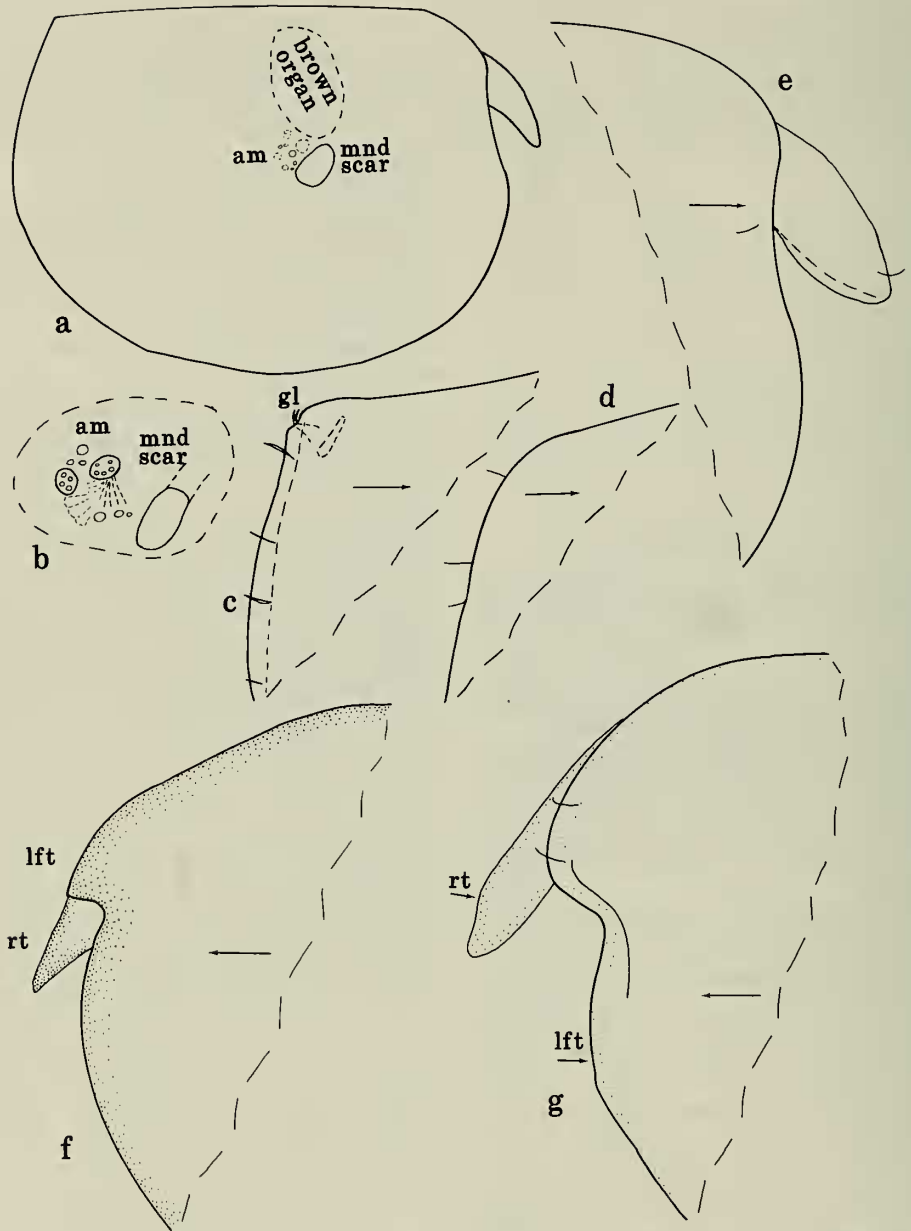


Fig. 2. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female: a, complete specimen from right side, length 0.99 mm; b, detail of central adductor muscle attachments and mandibular scar, from a; c, detail of posterodorsal corner of right valve, from a; d, outline of posterodorsal corner of left valve, iv; e, anterior of right valve, ov; f, anterior of carapace from left side showing both valves (edge stippled); g, anterior of carapace (body removed) from left side showing both valves. Abbreviations in figs. 2–11 and legends are: am, central adductor muscle attachments; ant, antenna; bas, basale; Bo, Bellonci organ; cx, coxale; dv, dorsal view; end, endopodite; epip, epipodite; esop, esophagus; ex, exopodite; fu, furca; gen, genitalia; gl, gland; im, inner margin of infold; iv, inside view; le, lateral eye; lft, left; ll, lower lip; lv, lateral view; mnd, mandible; mo, mouth; mv, medial view; mx, maxilla; nabs, not all bristles shown; ov, outside view; precx, precoxale; prot, protopodite; rt, right; ul, upper lip. Arabic numbers indicate limbs 1–7, as well as individual joints of each limb (the location of the numeral indicating whether a limb or joint is indicated); the number 5 is also used to designate the sensory bristle of the 5th joint of the 1st antenna. Roman numerals indicate the endites. Arrows indicate the anterior.

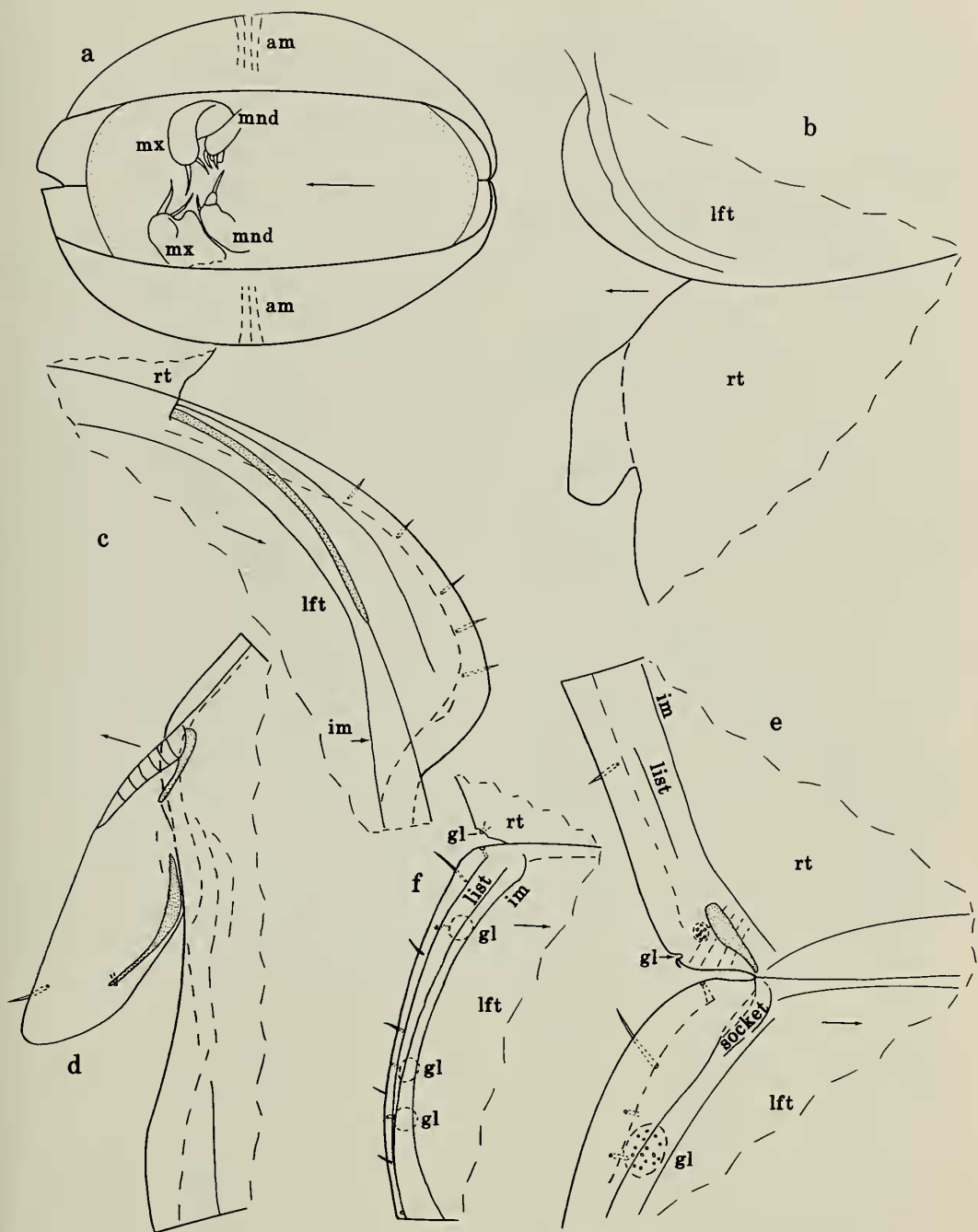


Fig. 3. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female: a, ventral view of partly open specimen showing parts of mandibles and maxillae in place; b, ventral view of partly open carapace showing rostrums of both valves; c, anterior of left valve, iv; d, anterior of right valve, iv; e, posterodorsal corners of both valves (not completely flat on slide), iv; f, posterior of left valve (not completely flat on slide) and posterodorsal corner of right valve, iv.

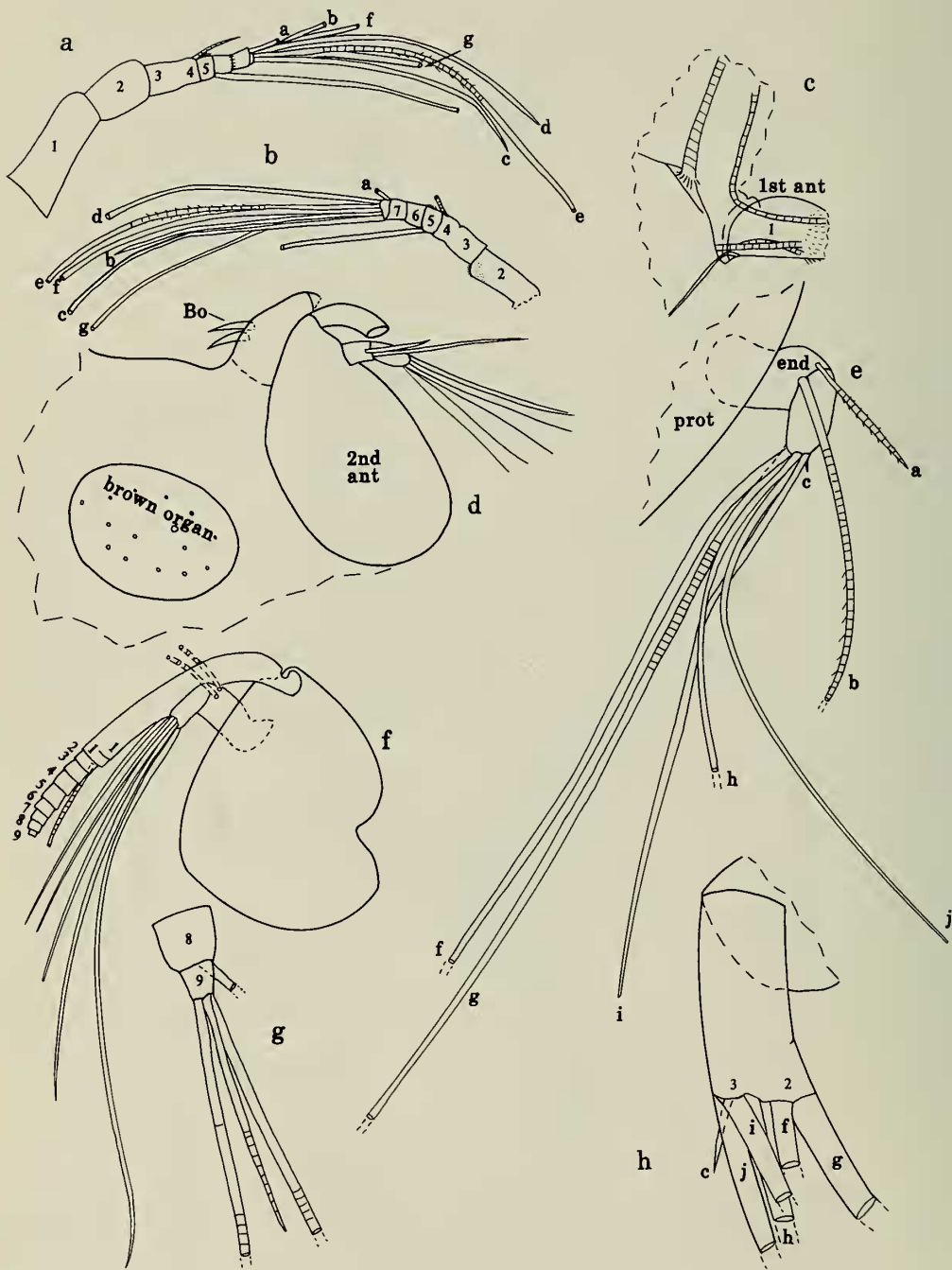


Fig. 4. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female: a, left 1st antenna, mv; b, right 1st antenna, mv; c, anterior of body showing 1st joint of left 1st antenna and striated muscles, mv; d, part of right side of body drawn in place (carapace removed), lv; e, endopodite and part of protopodite of right 2nd antenna, lv; f, left 2nd antenna (nabs), lv; g, tip of exopodite of left 2nd antenna, lv; h, distal part of endopodite of left 2nd antenna, lv.

with long terminal bristle with natatory hairs; bristles of joints 2–8 with natatory hairs (bristles and hairs not shown); 9th joint with 3 bristles (2 bristles longer than other and with short marginal spines) (Fig. 4g, spines not shown).

Mandible (Figs. 2a, b, 3a, 5, 9c–e): Coxale endite with proximal and distal sets of teeth separated by gap (Fig. 5d); proximal set comprising 4 broad cusps plus stout posterior tooth; surface between cusps and just proximal to cusps with slender spines; 1 indistinct bristle on corner just anterior to anterior cusp and another posterior to posterior cusp; 2 spinous bristles adjacent to stout posterior tooth; distal set of teeth comprising 2 flat teeth, each with 6 or 7 cusps (Fig. 5g); 1 stout tooth-like process (with marginal spines) proximal to flat teeth; 1 small bristle adjacent to process (Fig. 5d). Basale (Fig. 5b, e): distal edge with 5 triangular cusps, 1 triangular posterior cusp, and 1 small anterior cusp; lateral surface at distal edge with stout triangular tooth near anterior corner (arrow in Fig. 5b); lateral surface with long proximal hairs, 2 minute bristles near midlength and 4 longer bristles (none entwined) distal to them; anterior margin with long bristle distal to midlength (Fig. 5b, e); posterior margin hirsute, and with 2 short distal bristles (proximal with pointed tip, distal tubular); proximal end of basale with 3 transparent hirsute bristles (1 or 2 of these missing and represented by dashed sockets in illustrations); lateral surface near insertion of endopodite with long bare bristle (Fig. 5b; broken in Fig. 5e); 1 small bristle on medial surface adjacent to long bristle (not shown). Endopodite: 1st joint with 3 bare distal bristles (1 long dorsal, 1 short and 1 longer near ventral margin) (Fig. 5e); 2nd joint widening distally, with 3 terminal dorsal bristles (1 claw-like), and 1 long terminal bare ventral bristle; 3rd joint with 2 long stout spinous bristles (Fig. 5f), 5 short ringed bristles forming medial row along terminal edge, and 1 longer ringed spinose bristle (spines not shown) on terminal lateral edge; anterior margin an

medial surface of joint hirsute. Muscles extend from dorsal tip of coxale to scar anterior to central adductor muscle attachments (Figs. 2a, b, 5a).

Maxilla (Figs. 3a, 6, 9d, e): Endite I with 2 proximal and 9 terminal bristles (4 tubular) (Fig. 6b); endite II with 2 proximal and 8 terminal bristles (4 tubular); endite III with 1 proximal and 6 terminal bristles (2 tubular). Coxale with stout plumose dorsal bristle (Fig. 6c). Basale with 1 proximal stout spinous ventral bristle and 2 distal ventral bristles (Fig. 6a). Endopodite (Fig. 6a, c, d): 1st joint with 10 bristles; 2nd joint with anterior hairs, 2 stout claw-like bristles, and 5 slender ringed bristles (Fig. 6d).

Fifth limb (Figs. 7, 9e, f): Epipodite with plumose bristles forming 3 groups (ventral group with 5 bristles; middle group with 6 bristles; dorsal group with 5 bristles (4 long, 1 short) (Fig. 7b). Proximal protopodite with 4 ventral endites: endites I and II fused, endite I with long medial bristle and 3 shorter bristles closer to ventral margin; endite II with 1 long proximal bristle and 3 shorter bristles closer to ventral margin (longest of later with long marginal spines); endite III with 6 bristles (1 claw-like); endite IV with 9 bristles (2 claw-like). Basale with ventral margin divided into broad proximal ventral part with 3 slender ventral bristles and 2 bristles (1 medial bare and 1 lateral with long spines) near midwidth, and distal part with 3 distal bristles near ventral margin and 1 long lateral plumose bristle closer to dorsal margin. Exopodite represented by 3 bristles (longest bare, others spinous) on distal dorsal margin of basale (Fig. 7a, c). Endopodite with 2 joints: 1st joint with 3 ventral and 1 dorsal bristle near midlength; 2nd joint with 2 stout claw-like bristles and 1 slender ringed bare ventral bristle.

Sixth limb (Figs. 8a–c, 9e, f): Epipodite with plumose bristles forming 3 groups (ventral group with 5 bristles (Fig. 8a); middle group fragmented (number of bristles unknown); dorsal group with 7 bristles (dorsal bristle short)). Precoxale and coxale

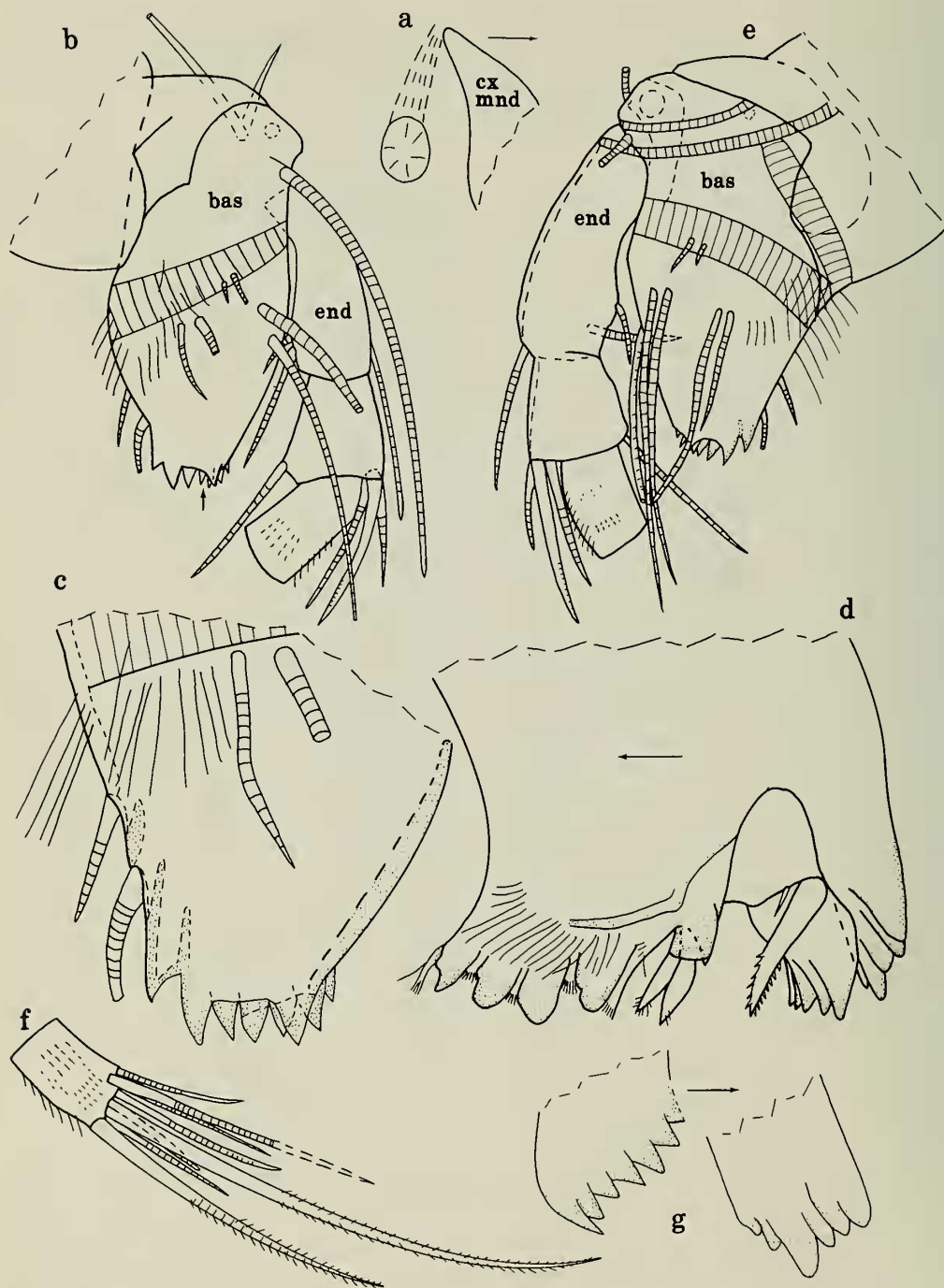


Fig. 5. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female, mandible: a, proximal tip of coxale of right limb showing muscle (dashed) attaching coxale to carapace; b, basale and part of endopodite of right limb (muscles and bristles striated), lv; c, distal part of basale endite of right limb, lv; d, distal part of coxale of right limb, mv; e, basale and part of endopodite of left limb, lv; f, tip of endopodite of left limb, lv; g, proximal (at left) and distal (at right) sets of teeth of coxale endite of left limb, mv.

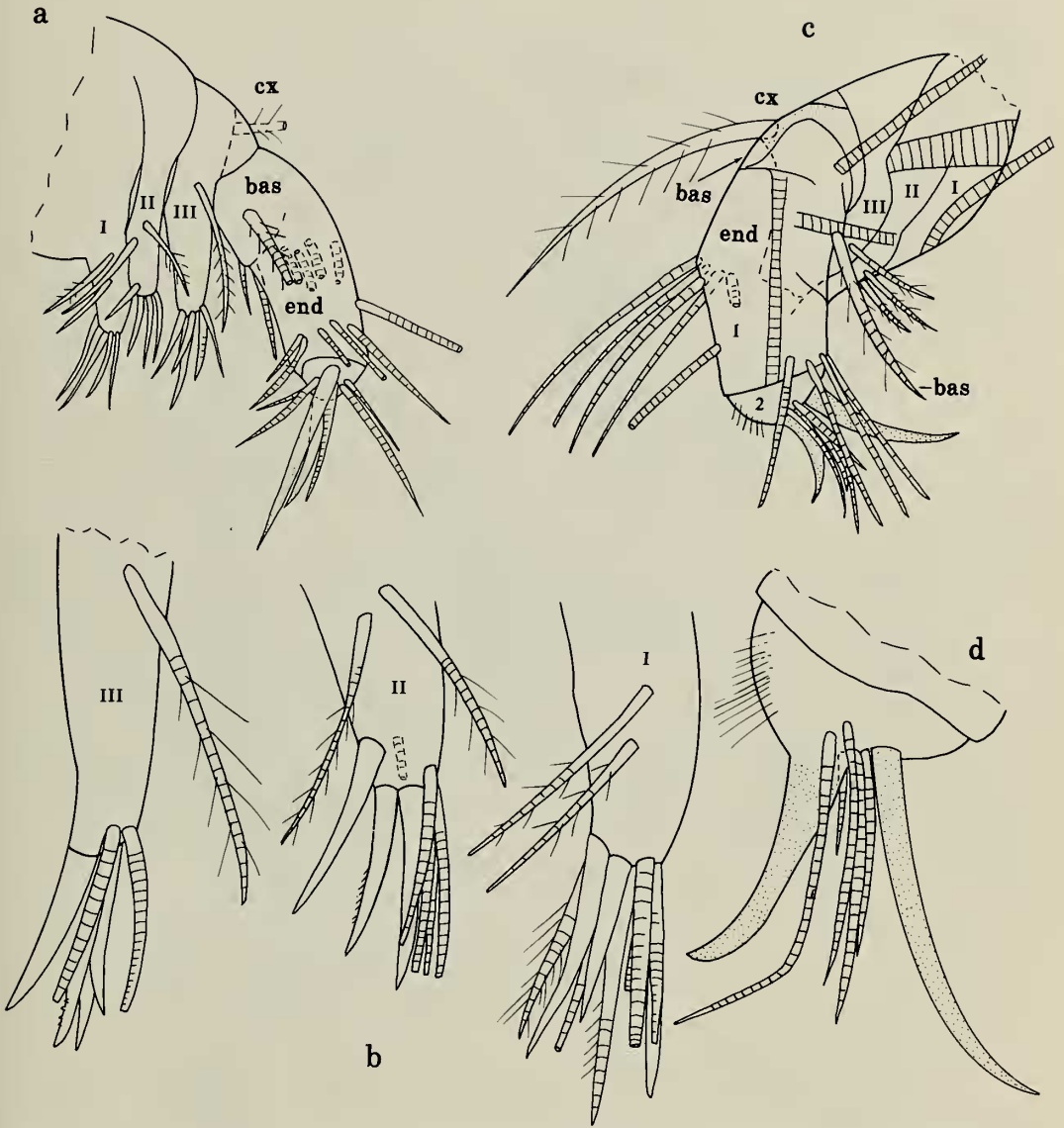


Fig. 6. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female, maxilla: a, left limb (nabs on endites), mv; b, endites of right limb, lv; c, right limb (nabs on endites; bristles and muscles striated), mv; d, end joint of endopodite of right limb, mv.

obscured, but each with few ventral bristles (Fig. 8b). Basale with weak suture partly separating distal ventral corner (ventral end of suture near midlength of basale) (Fig. 8b, c); proximal part with 2 spinous ventral bristles, and 1 distal spinous lateral bristle near dorsal margin; distal ventral corner with 2 spinous bristles. Exopodite well developed with 5 long bristles (3 plumose, 2

bare). Endopodite 3 jointed: 1st joint with 3 ventral bristles; 2nd joint with 3 bristles (2 ventral, 1 dorsal); 3rd joint with 3 long bare terminal bristles (middle bristle stouter than others and somewhat claw-like). Distal end of 6th limb extends well past distal end of 3rd joint of 5th limb (Fig. 9e, f).

Seventh limb (Figs. 8d, 9g): Elongate with 3 terminal bristles (1 longer than others).



Fig. 7. *Spelaeocia saturno*, new species, holotype, USNM 194617, adult female, 5th limb: a, left limb, mv; b, epipodite of left limb, mv; c, basale, exopodite and endopodite of right limb, mv.

Furca (Fig. 8e–g): Each lamella with 4 claws followed by 4 bristles with indistinct closely spaced rings (rings not shown) (Fig. 8e); minute glandular opening between claws 1 and 2 (closer to claw 2) (Fig. 8e); unpaired bifurcate bristle posterior to furca. (Claw 1 of left lamella missing on USNM 194617; not all claws shown on Fig. 9f.)

Bellonci organ (Figs. 8h, 9c, e): Branching distally, each branch with rounded bare tip.

Lips: Upper lip not examined in detail, but appearing typical for genus (Fig. 9a). Lower lip with triangular process on each side of mouth (Fig. 9b).

Genitalia (Fig. 8f): Minute incomplete

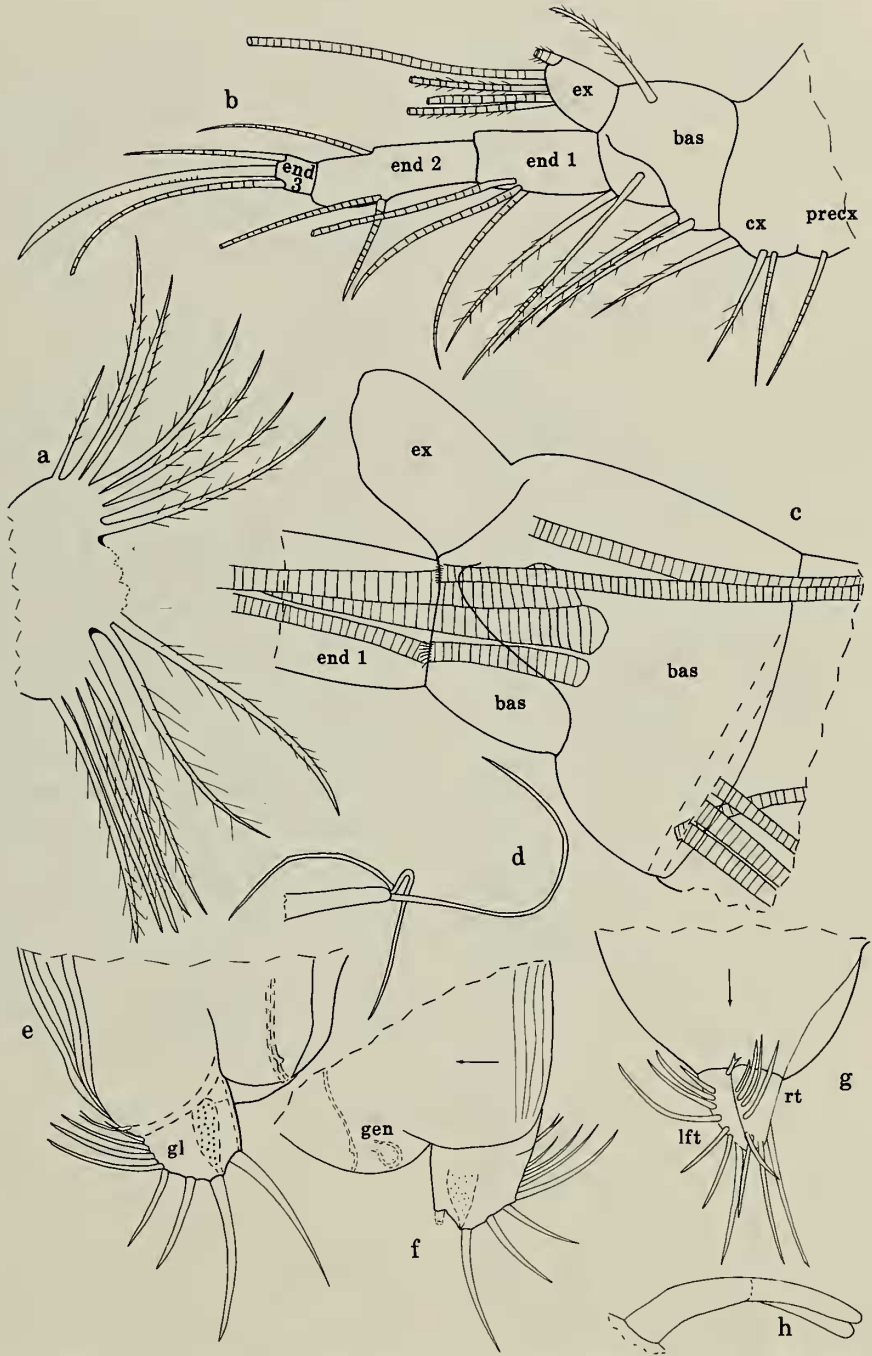


Fig. 8. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female: a, epipodite or right 6th limb (nabs), mv; b, distal part of right 6th limb, lv; c, part of right 6th limb showing internal striated muscles (no bristles shown), lv; d, left 7th limb, lv; e, posterior of body with right furcal lamella (sclerite and gland stippled); f, posterior of body showing genitalia and left furcal lamella; g, ventral view of posterior part of body showing furca (body slightly tilted); h, Bellonci organ.

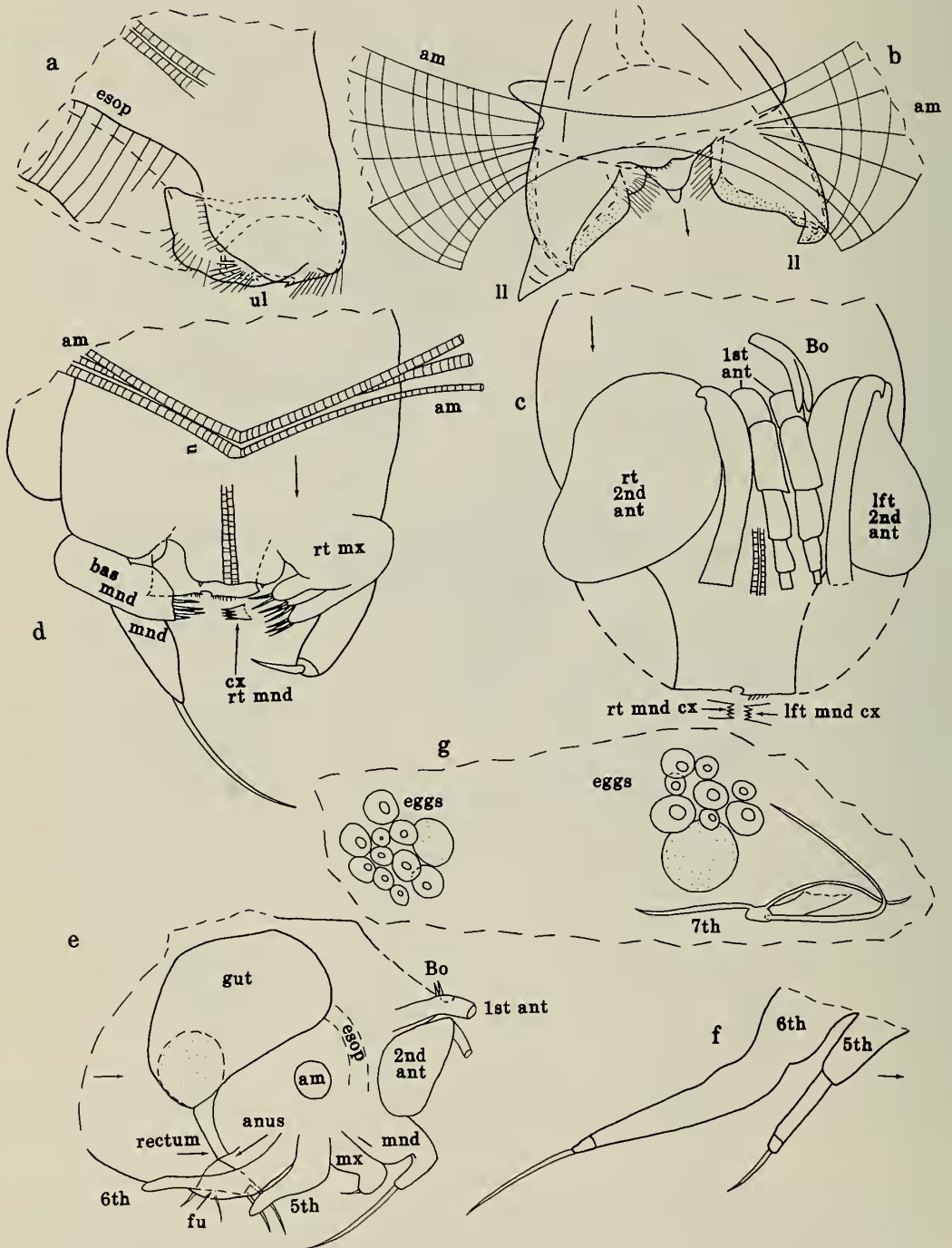


Fig. 9. *Spelaeoecia saturno*, new species, holotype, USNM 194617, adult female: a, part of anterior of body squashed under cover slip showing upper lip and esophagus; b, dorsal view of anterior of body under cover slip showing lower lips and central adductor muscles; c, anterior of body (not under cover slip) showing location of parts of appendages, dv; d, ventral view of part of body (not under cover slip) showing location of parts of appendages; e, part of body from right side showing location of parts of limbs and organs (mass in gut stippled) (not under cover slip); f, location on body of distal ends of right 5th and 6th limbs drawn from right side of body (nabs, not under cover slip); g, fragment of body showing one 7th limb and 2 clusters of spheres interpreted to be eggs (not under cover slip).

ring proximal and anterior to furca may be part of genitalia. (Absence of small bristles adjacent to ring suggests that USNM 194617 may not be adult.)

Posterior of body (Figs. 8e, 9e): Rounded, unsegmented.

Ganglion (Figs. 2a, 4d): Brown rounded "organ" within body posterior to protopodite of 2nd antenna.

Number of eggs (Fig. 9g): About 9 to 11 unextruded spheres of various diameters interpreted to be eggs present on each side of posterior part of body of USNM 194617.

Gut content (Fig. 9e): Unidentified oval mass at posterior end of gut of USNM 194617 (mass stippled in Fig. 9e).

Description of A-1 male (Figs. 10, 11).—Carapace (Fig. 10a) similar in shape and structures to that of adult female.

Carapace size (length, height in mm): USNM 1194618, 0.83, 0.56.

First antenna (Fig. 10b, c): 1st joint with minute distal spines (Fig. 10b). 2nd joint with minute distal medial spines (Fig. 10b); 3rd joint bare, fused to 4th joint (boundary indicated by ventral and dorsal indentations and discontinuities in sclerotization at ventral and dorsal margins). 4th joint shorter than 3rd joint and with a slender ventral and dorsal bristle, (ventral bristle broader than usual and somewhat diaphanous; diaphanous nature of bristle suggests that it could easily break off during dissection). 5th and 6th joints fused on lateral side; 5th joint with indistinct short dorsal spines and long ventral filament. 6th joint with short distal spines. 7th joint with ringed a-bristle and long ventral b- and c-bristles. 8th joint with d-, e-, f-, and g-bristles (e-bristle lateral and with widely separated short marginal spines at midlength).

Second antenna: Protopodite bare. Endopodite 3-jointed (partly obscured and twisted on mounted limbs of USNM 194618) (Fig. 10d): 1st joint with a- and b-bristles; 2nd joint with short c- and d-bristles (d-bristle observed only on right limb), and long stout f- and g-bristles; 3rd joint with long stout filamentous h-, i-, and j-

bristles. Exopodite with 9 joints: 1st joint divided into long proximal and short distal parts, with long terminal bristle with natatory hairs; bristles of joints 2–8 with natatory hairs; 9th joint with 3 bristles (1 bristle longer than others).

Mandible: Coxale endite with proximal and distal sets of teeth separated by gap: proximal set comprising 4 broad cusps plus stout posterior tooth; surface between cusps and just proximal to cusps with slender spines; 1 indistinct bristle on corner just anterior to anterior cusp and another posterior to posterior cusp; 2 spinous bristles adjacent to stout posterior tooth; distal set of teeth comprising 2 flat teeth, each with 6 or 7 cusps; 1 stout tooth-like process (with marginal spines) proximal to flat tooth; 1 small bristle adjacent to process. Basale: distal edge with 5 triangular cusps, 1 triangular posterior cusp, and 1 small anterior cusp; lateral surface at distal edge with stout triangular tooth near anterior corner; lateral surface with long proximal hairs, 2 minute bristles near midlength and 4 longer bristles, none entwined; anterior margin with long bristle distal to midlength; posterior margin hirsute, and with 2 short distal bristles (proximal with pointed tip, distal tubular); proximal end of basale with 3 transparent hirsute bristles (1 or 2 of these missing); lateral surface near insertion of endopodite with long bare bristle; 1 small bristle on medial surface adjacent to long bristle. Endopodite: 1st joint with 3 bare distal bristles (1 long dorsal, 1 short and 1 longer near ventral margin); 2nd joint widening distally, with 3 terminal dorsal bristles (1 claw-like), and 1 long terminal bare ventral bristle; 3rd joint with 2 long stout spinous bristles, 5 short ringed bristles forming medial row along terminal edge, and 1 longer ringed spinous bristle on terminal lateral edge; anterior margin an medial surface of joint hirsute. Muscles extend from dorsal tip of coxale to central adductor muscle scar area.

Maxilla (Fig. 10e–h): Endite 1 with 2 proximal and 10 terminal bristles (2 tubu-

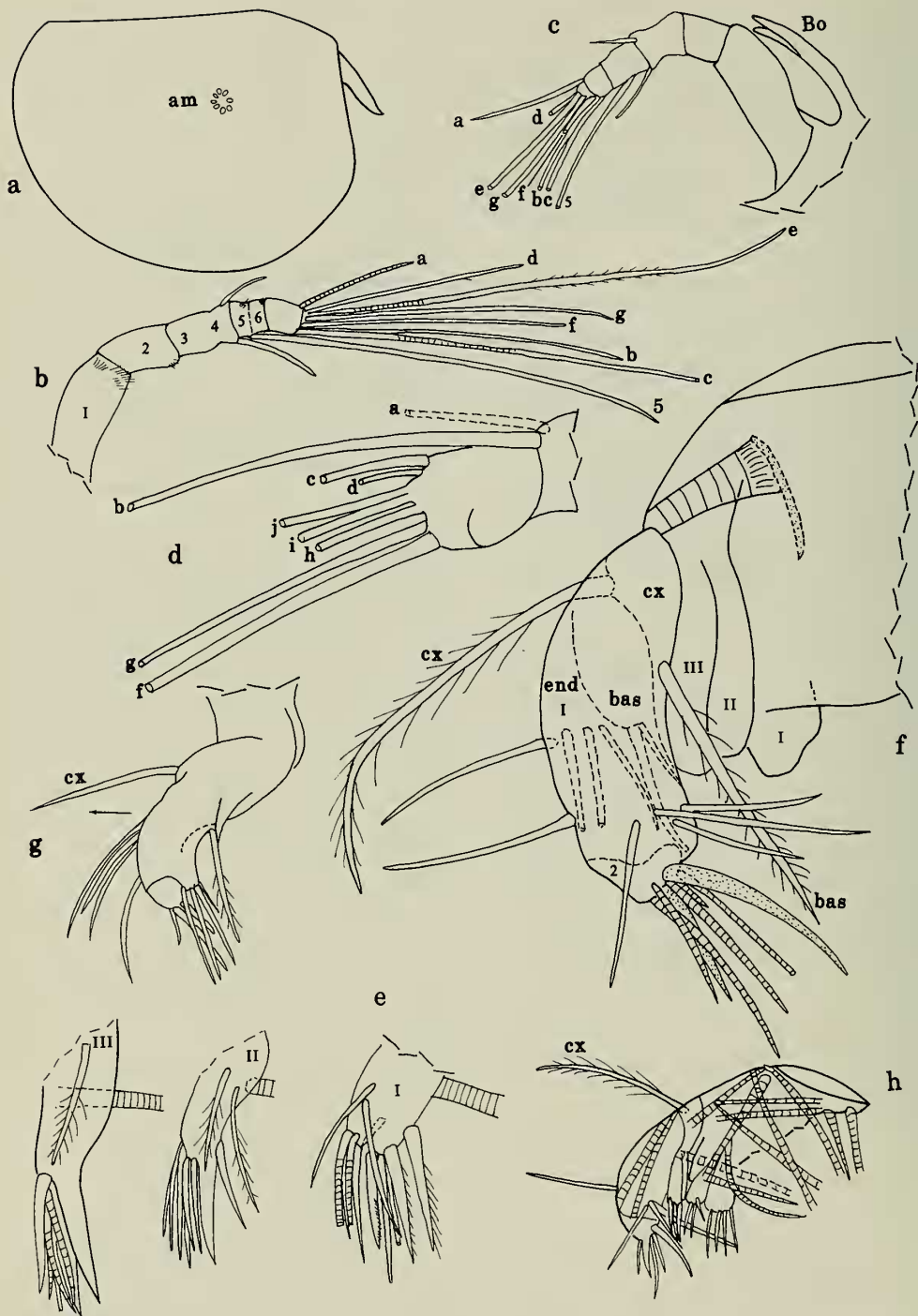


Fig. 10. *Spelaeoecia saturno*, new species, paratype, USNM 194618, A-1 male: a, complete specimen from right side, length 0.83 mm; b, right 1st antenna, lv; c, anterodorsal part of body from left side showing Bellonci organ and left 1st antenna; d, endopodite right 2nd antenna (only proximal ends of bristles shown), lv; e, endites of left maxilla, lv; f, left maxilla (endite bristles not shown), lv; g, left maxilla in place on body (nabs. not under cover slip), lv; h, left maxilla showing striated muscles (nabs. not under cover slip), lv.

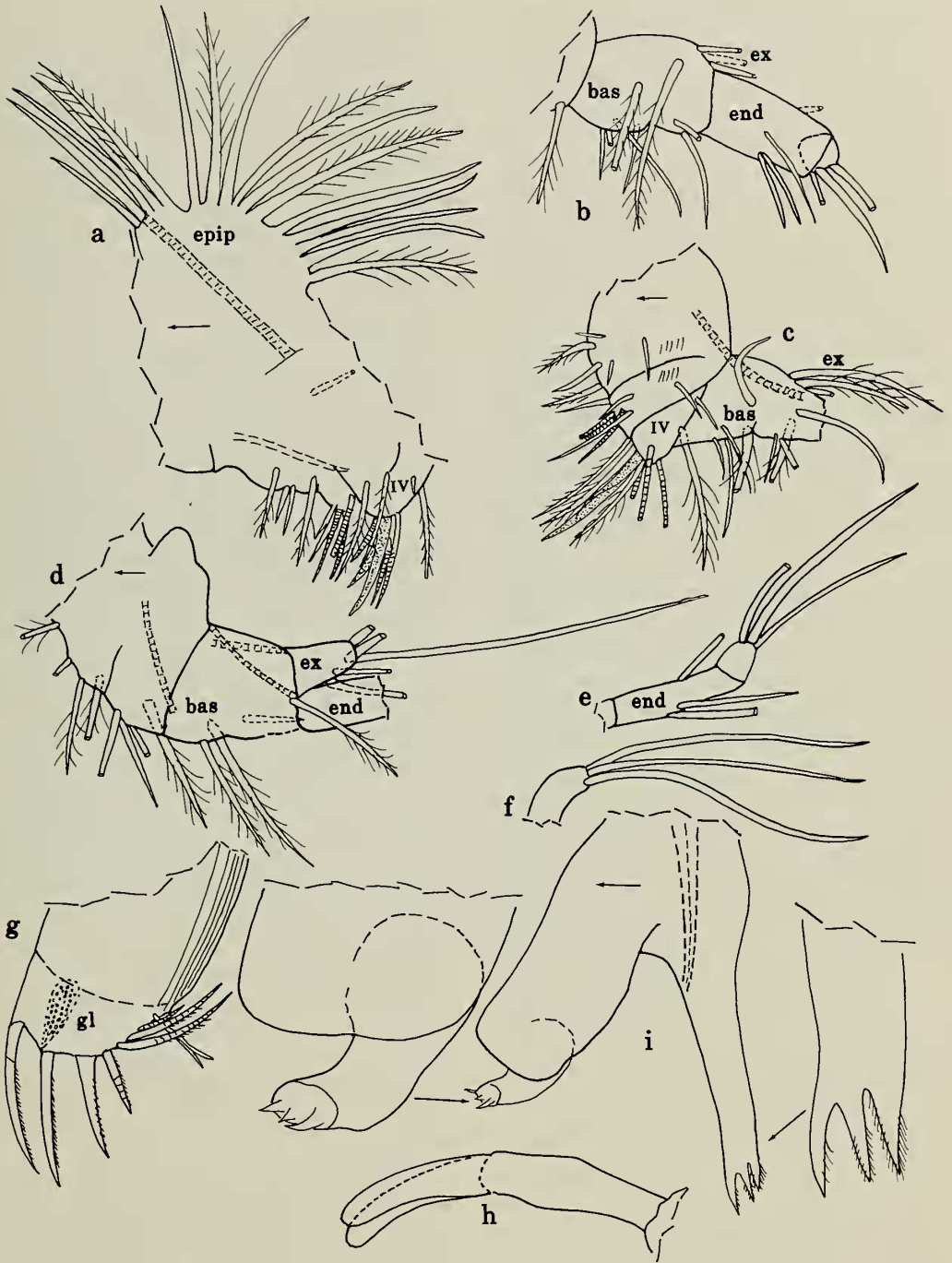


Fig. 11. *Spelaeoecia saturno*, new species, paratype, USNM 194618, A-1 male: a, proximal part of left 5th limb, lv; b, distal part of left 5th limb (nabs), lv; c, proximal part of right 5th limb, mv; d, part 6th limb; e, distal part right 6th limb, mv; f, 7th limb; g, posterior of body from left side showing left lamella of furca (not under cover slip); h, Bellonci organ; i, copulatory organ under cover slip, anterior to left.

lar) (Fig. 10e); endite II with 2 proximal and about 8 terminal bristles (3 or 4 tubular); endite III with 1 proximal and about 7 terminal bristles (2 tubular). Coxale with stout plumose dorsal bristle (Fig. 10f). Basale with 1 proximal stout spinous ventral bristle and 2 distal ventral bristles (Fig. 10f). Endopodite (Fig. 10f): 1st joint with 9 or 10 bristles; 2nd joint with anterior hairs, 2 stout claw-like bristles, and 5 slender ringed bristles.

Fifth limb (Fig. 11a–c): Epipodite with plumose bristles forming 3 groups (ventral group with 5 bristles; middle group with 6 bristles; dorsal group with 5 bristles (4 long, 1 short)) (Fig. 11a). Proximal protopodite with 4 ventral endites and no gland; endites I and II fused; combined endites I and II with medial bristle near midheight and 4 or 5 bristles closer to ventral margin (medial bristles obscured on left limb of USNM 194618 (Fig. 11a)); endite III with medial bristle near midheight and 5 or 6 bristles closer to ventral margin (1 claw-like, 3 tubular with blunt tips); endite IV with 9 bristles (2 claw-like, 3 tubular with blunt tips). Basale with ventral margin divided into broad proximal part with 5 bristles, and distal part with 3 or 4 bristles (Fig. 11b, c). Exopodite represented by 3 bristles (longest bare, others spinous) on distal dorsal margin (Fig. 11b, c). Endopodite with 2 joints (Fig. 11b): 1st joint with 4 bristles (1 dorsal, 3 near ventral margin); 2nd joint with 3 bristles (middle and dorsal bristles claw-like). (Tubular bristles ringed on Fig. 11a, c).

Sixth limb (Fig. 11d, e): Both limbs of USNM 195618 fragmented. Epipodite with plumose bristles forming 3 groups (fragment with 5 bristles each in ventral and dorsal groups and 4 in middle group, but bristles could be missing). Exopodite well developed and with 5 bristles (Fig. 11d). Endopodite 3 jointed: 1st joint fragmented; 2nd joint with 3 bristles (1 ventral, 2 dorsal); 3rd joint with 3 long terminal bristles (Fig. 11e). Distal end of 6th limb extends well past distal end of end joint of 5th limb.

Seventh limb (Fig. 11f): Elongate with 3 terminal bristles (1 stouter than others).

Furca (Fig. 11g): Each lamella with 4 claws followed by 3 ringed bristles; 4th claw with indistinct rings. Claw 1 with indistinct proximal suture. Claws 1–4 with indistinct teeth along posterior edge; bristles 5–7 with few indistinct spines; minute glandular opening between claws 1 and 2 (closer to claw 2) placed laterally on lamella close to edge. Unpaired bifurcate bristle posterior to furca.

Bellonci Organ (Fig. 11h): Branching distally, each branch with rounded bare tip.

Lips: Not examined.

Genitalia (Fig. 11i): Copulatory organ with 2 branches: anterior branch with rounded tip and 3 minute indistinct processes; posterior branch with 3 spined processes (spines longer on posterior process).

Posterior of Body (Fig. 11g): Rounded, unsegmented.

Gut Content: Dark brown unidentified particulate matter in gut of USNM 194518.

Comparisons.—The first antenna of *S. saturno* differs from that of previously described species in the genus in lacking a dorsal bristle on the 2nd joint. The carapace of the new species, *S. saturno*, resembles that of *S. parkeri* in having the right rostrum much narrower than that of the left. The adult furcae of both species have 4 claws followed by bristles (3 bristles on *S. parkeri*, 4 on *S. saturno*). The furcae of the two species differ mainly in that the anterior bristle of *S. parkeri* is much longer than that of *S. saturno* (about twice length of claw 1 in *S. parkeri*, about same length in *S. saturno*).

Spelaeoecia cubensis is the only species of *Spelaeoecia* that has been described previously from Cuba. The carapace of the adult female *S. cubensis* (length 1.98–2.31 mm) is considerably longer than that of *S. saturno* (length 0.99 mm), and the rostrum of the right valve is not more slender than that of the rostrum of the left valve. The 2nd joint of the 1st antenna of *S. cubensis* bears a dorsal bristle, absent on *S. saturno*.

The lateral surface of the basale of the mandible of *S. cubensis* bears 2 long entwined bristles; the bristles are not entwined on *S. saturno*. The furca of *S. cubensis* bears 5 claws, whereas that of *S. saturno* bears 4 claws followed by 3 bristle-like claws; also the furca of *S. cubensis* bears a very large glandular process between claws 1 and 2 compared to a minute glandular process on *S. saturno*.

Key to the species of *Spelaeoecia*^a
(adults except *S. jamaicensis*^b)

1. Rostrum of right valve much narrower than that of left valve 2
- Rostrum of right valve same as that of left valve 3
2. Bristle following claw 4 of each lamella of furca almost twice length of claw 1 *S. parkeri*
- Bristle following claw 4 of each lamella about same length as claw 1 *S. saturno*, n. sp.
3. Each lamella of furca with 5 claws *S. cubensis*
- Each lamella of furca with more than 5 claws 4
4. Carapace longer than 2.25 mm ... *S. capax*
- Carapace shorter than 1.95 mm 5
5. Posterodorsal gland of right valve on protuberance, carapace shorter than 1.15 mm *S. styx*
- Posteroventral gland of right valve not on protuberance, carapace longer than 1.25 mm 6
6. First antenna without ventral bristle on 3rd joint 7
- First antenna with ventral bristle on 3rd joint 9
7. First antenna with ventral bristle on 4th joint *S. jamaicensis*
- First antenna without ventral bristle on 4th joint 8
8. Carapace with evenly rounded posterior edge *S. sagax*
- Carapace with projecting posterior edge *S. barri*
9. Furca with 7 claws *S. bermudensis*
- Furca with 6 claws *S. mayan*

^a Revision of key presented in Kornicker & Iliffe (1998:10).

^b A-1 or A-2 instars (Kornicker & Iliffe 1992:5, 11), but key should hold for the instars.

Spelaeoecia cubensis Kornicker & Yager, 1996

Spelaeoecia cubensis Kornicker & Yager, 1996:3–14, figs. 2–9.

Holotype.—USNM 194208, undissected adult male in alcohol.

Type locality.—Cueva de los Carboneros, Playa Giron, Matanzas Province, Cuba.

Material.—Cueva El Brinco: USNM 194619, partly dissected adult male in alcohol (left 2nd antenna and copulatory organ missing); USNM 194620, undissected adult female in alcohol. Cueva 1900: USNM 194621, undissected A-1 male in alcohol.

Distribution.—Cuba, southern Matanzas Province, in or near Playa Giron: Cueva de los Carboneros, collected 14 Sep 1992, about 21 m depth; Casimba Susana, collected 11 Sep 1992; 24.4 m depth, 35 ppt salinity; Cueva El Brinco, collected 26 Jun 1994; Cueva 1900, collected 15 Sep 1992.

Supplementary description of adult male.—Carapace size (length, height in mm): USNM 194619 (flattened open carapace with body removed, viewed from inside, dimensions of flattened valves probably greater than if measurements had been made of whole specimen): right valve 2.07, 1.09; left valve 2.15, 1.03.

Supplementary description of adult female.—Carapace size (length, height in mm): USNM 194260, 2.27, 0.99.

Supplementary description of A-1 female.—Carapace size (length, height in mm): USNM 194621, 1.73, 0.80.

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